USER MANUAL

PLEASE READ THIS MANUAL CAREFULLY.

IT CONTAINS IMPORTANT SAFETY INFORMATION.

ITEM # DIES5500

DIESEL GENERATOR

PREFACE

Thank you for purchasing a - - diesel generating set.

This operation manual will tell you how to operate and service your - - generation set correctly.

Please read this manual before using the generating set to ensure the proper operation.

Follow the instructions to keep your generating set in the best working condition and extend the life of it. If you have any commends or problem, please contact with our sales company or the authorized agent.
This manual deals with the general items of the - - diesel generating set.However the manual may vary with the development of the products in the future.
Please give special attentions to warnings and cautions.

⚠ WARNING	Indicates that the severe personal injury even death will result if the instructions are not followed.
⚠ CAUTION	Indicates that the serious personal injury or equipment damage will result if the instructions are not followed.

- - diesel generating set will meet your requirement if you operate it according to the manual instruction. Otherwise serious personal injury and equipment damage will result.
So, - - reconfirms that you must to read and understand this manual before operating the generating set.

WARNING:

1. TO PREVENT THE FIRE

Never add fuel to the fuel tank while the engine is running,
Wipe off the overflowed fuel oil with a clean cloth. Keep explosives and other flammable products and from the generating set.

- To prevent the fire and to provide adequate ventilation, keep the generating set at least one meter away from buildings and other equipment during operation.

- Operate the generating set on a level surface.

- Do not put the generating set indoors while the engine is hot.

1. To PREVENT FROM INHALING THE EXHAUST

Exhaust gas contains poisonous carbon monoxide,which is harnful to the health.
Never use the generating set at the confined places or poor ventilated locations.
If it's necessary to run the generating set indoors, be sure to provide the adequate ventilation .

3. Danger: SCALDING can accure

The muffler and the engine body are very hot while the engine is running or just after running, do not touch these parts to prevent from being scalded.

4. ELECTRIC SHOCKS, SHORT CIRCUITS

To avoid electric shocks or short circuits, do not touch the generating set when your hands are wet.This generating set is not waterproof, so it should not be used in a place exposed to rain snow or water sprays. Use of the generating set tor in a wet place can cause short circuits and electric shocks during operation.

- The generating set should be grounded to prevent electrical shocks from faulty appliances. Connect a length of heavy wires between the generating sets ground terminal and an external ground source.

- Do not hook up tools or other apparatus to generating set rator before it has been started. If equipment is attached, generator starting may cause sudden movements of the equipment and result in injuries and accidents. Be sure to disconnect any apparatus from the generating set or prior to starting.

CAUTION

- Most appliance motors require more than their rated wattage for start-up.
- Do not exceed the the specified current limit of any socket.
- Do not connect the generating set to a household circuit. This could cause damage to the generating set and to electrical appliances in the house.

5. WHEN CHARGING THE BATTERY

Battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and get prompt medical attention, especially if your eyes are affected.
Batteries generate hydrogen gas, which can be highly explosive. Do not smoke or allow flames or sparks near a battery, especially during charging.
Charge the battery in a fully ventilated place.

6. PLEASE KEEP THE CHILDREN FROM THE GENERATOR

A generating set may cause hazards that are not recognized by the layman and especially not recognized by children. Protect children by keeping them at a safe distance from the generating set.

7. IN USING

Advice on the need of personal protection equipment, e. g. hearing protection where the application is known.

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1. MAIN TECHNICAL SPECIFICATIONS AND DATA

1.1 Main Technical Specifications and Data

Item \ Model		LDE2800X LDE5800E		LDE3800X LDE3800E LDE3800T		LDE5800X LDE5800E LDE5800T		LDE5800X3 LDE5800E3 LDE5800T3		LDE6800X LDE6800E LDE6800T		LDE6800X3 LDE6800E3 LDE6800T3	
Generating Set	Rated frequency (Hz)	50	60	50	60	50	60	50	60	50	60	50	60
	Rated power (kW)	1.7	2	2.8	3.3	4.2	5	5kVA	6kVA	5	5.5	5.5kVA	6.3kVA
	Rated voltage (AC) (V)	230	240/120	230	240/120	230	240/120	400/230	416/240	230	240/120	400/230	416/240
	Rated current (AC) (A)	7.4	8.3/16.7	12.2	13.8/27.5	18.3	20.8/41.7	7.2	8.3	21.7	22.9/45.8	7.9	8.7
	Rated revolution speed (r/min)	3000	3600	3000	3600	3000	3600	3000	3600	3000	3600	3000	3600
	Phase No.	Single phase						Three phases		Single phase		Three phases	
	Power factor (cos Φ)	1						0.8 (lag)		1		0.8 (lag)	
	Excitation mode	Controlled silicon self excitation constant voltage											
	DC output	12V/8.3A						without		12V/8.3A		without	
	Operation mode	12 hour continuous running											
	Structure mode	EX: Frame type T: Hand cart type											
	Coupling method	Transmission rigid connection											
	Gross weight (kg)	54		EX: 64 T: 140		EX: 98 T: 165		EX: 98 T: 165		EX: 95 T: 171		EX: 95 T: 171	
	Overall dimensions (L×W×H)(mm)	635 × 465 × 535		EX:700 × 465 × 560 T: 830×520×740		EX:725 × 500 × 630 T:935 × 560 × 850		EX:725 × 500 × 630 T:935 × 560 × 850		EX:725 × 500 × 630 T:935 × 560 × 850		EX:725 × 500 × 630 T:935 × 560 × 850	

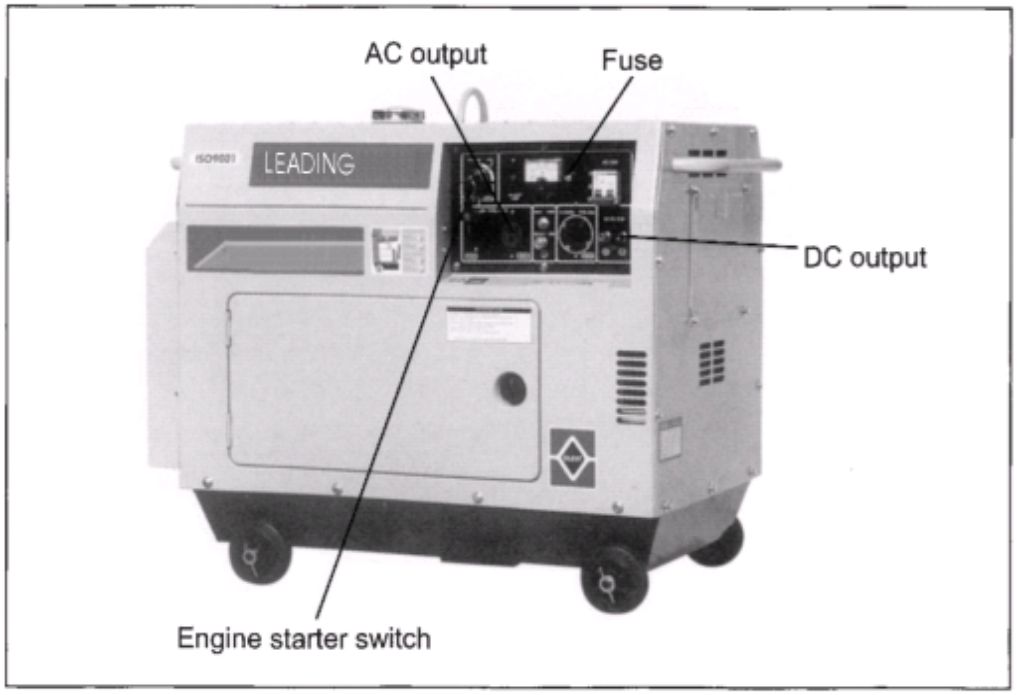
Item \ Model		LDE2800X LDE2800E		LDE3800X LDE3800E LDE3800T		LDE5800X LDE5800E LDE5800T		LDE5800X3 LDE5800E3 LDE5800T3		LDE6800X LDE6800E LDE6800T	LDE6800X3 LDE6800E3 LDE6800T3
Engine	Model	LD170FG		EX: LD178FG T: LD178FGE		EX: LD186FG T: LD186FGE		EX: LD186FG T: LD186FGE		LD186FAG	LD186FAG
	Type	4-stroke, single-cylinder, air-cooled, direct injection diesel engine									
	Continual output (kW/rpm)	2.5	2.8	3.7	4	5.7	6.3	5.7	6.3	5.7/3000	6.3/3600
	Max. Power (kW/rpm)	2.8	3.1	4	4.4	6.3	6.6	6.3	6.6	6.3/3000	6.6/3600
	Bore×stroke (mm)	70×55		78×62		86×70		86×70		86×72	86×72
	Displacement (L)	0.211		0.296		0.406		0.406		0.418	0.418
	Cooling system	Forced air-cooled system									
	Lubricating system	Pressure splashing									
	Lube oil capacity (L)	0.75		1.1		1.65		1.65		1.65	1.65
	Starting system	X: Recoil starter T.E: Electric starter								X: Recoil starter E.T: Electric starter	
	Fuel oil	Diesel oil								Diesel 0# (summer) -10# (winter)	
	Fuel oil tank volume (L)	7.5		EX: 13.5 T: 12.5		EX: 15 T: 16		EX: 15 T: 16		EX: 15 T: 16	EX: 15 T: 16
	Low oil alarm system	with									

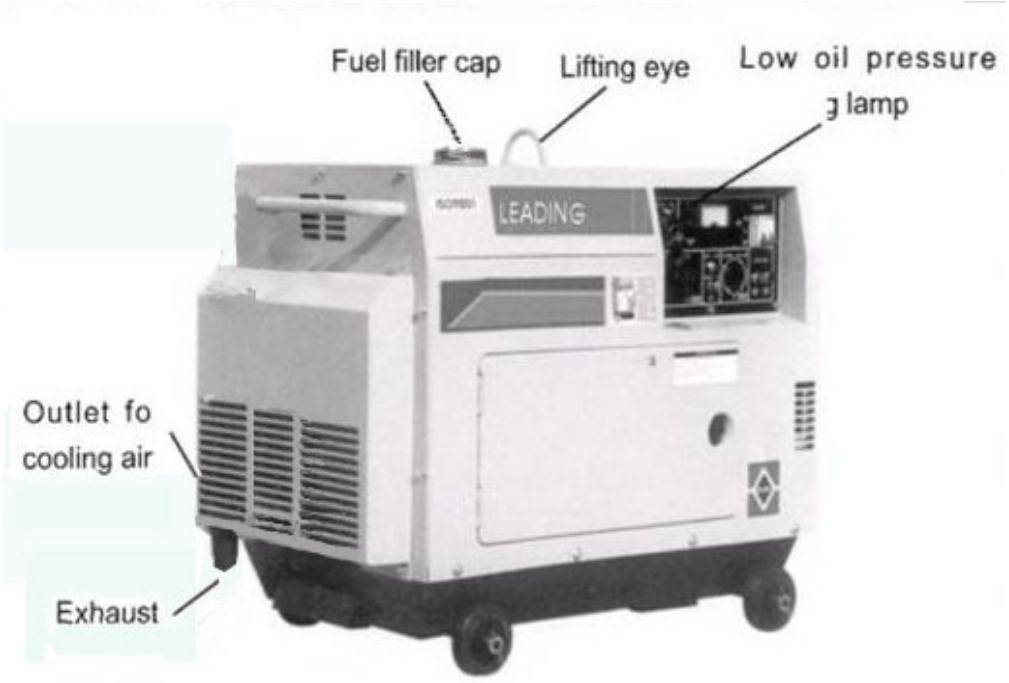
air-cool genset is cooling by air . if altitude is more than 1000m , air will be rarefaction , so the effect will be not good . In case overheating , for gensets which are using in high altitude (more than 1000m) , it should be running in low load . Also it dosent mean that gensets can be overload if altitude is less than 1000m .

specification of genset in different temperature and altitude

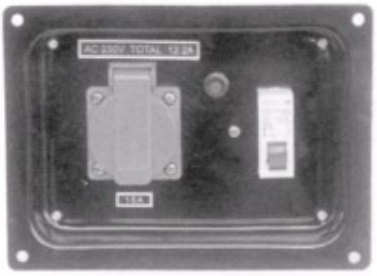
temperature						
altitude	25℃	40℃	45℃	50℃	55℃	60℃
0～1000 M	1.04	1	0.97	0.94	0.91	0.88
1000～1500 M	1.01	0.97	0.94	0.91	0.88	0.85
1500～2000 M	0.98	0.94	0.91	0.88	0.86	0.83
2000～2500 M	0.95	0.91	0.88	0.86	0.83	0.8
2500～3000 M	0.91	0.87	0.84	0.82	0.79	0.77

2.1 Part name (LDE series T type)





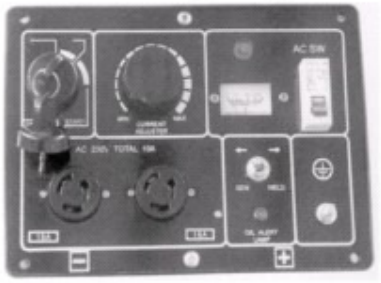
2.1 Control Panel



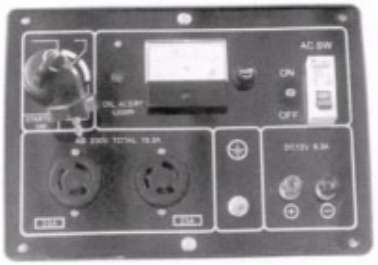
C type panel

E type panel
E model receptacle panel

E3 type three-phase panel



EW welding panel



E type basic model panel

E type panel
A model double voltage panel

Intelligent control panel

3. PREPARATION FOR STARTING

3.1 Selection and handling of the fule oil

- Selection of fule oil.
  Only use the light diesel, which is most suitable for the engine.

- Keep dust and water out of the fule
  When filling the fule tank from druns, make sure that no dust or water is mixed in the fule. Otherwise the serious fule injection pump and nozzle problems will result.

- Do not overfill
  Overfilling is very dangerous. Do not fill the tank beyond the top of the red plug inside the fule oil filter.

WARNING

- Refuel in a well-ventilated area with engine stopped.
- Do not smoke or allow flames or sparks in the area where the engine is refueled or where the fule oill stored.
- Do not overfill the tank, make sure the filler cap is securely closed after refueling.
- Be careful not to spill fuel when refueling. If any fuel is spilled, make sure the area is dry before starting the engine.

3.2 Check and refill the engine oil

WARNING

- Always check the engine oill level with the generating set on a level surface before
  starting and refill if necessary.
- The engine may be damaged if operated with insufficient engine oil, it is also dangerous to refill too much engine oill as sudden increase in engine speed may be caused by its combustion.

CAUTION:

— — LDE series generating set are equipped with low oil warning system.

This system will stops the engine automatically when the oil level falls below the

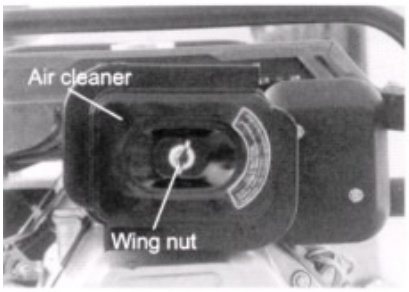
lower level. This prevents accidents such as bearing seizures, etc.

- Select the most applicable engine oil
  It is very important to select the applicable engine oil for keep up the performance and life of the generating set. If inferior engine oil is used, or if your engine oil is not replaced periodically, the risk of piston seizure, piston ring sticking and accelerated wear of the cylinder liner, bearing and other moving components increases significantly. So the generating set life will be shortened. - - recommends CC/CD oil classified by APL.Choose the applicable viscosity oil according to the local ambient temperature.

3.3 Service the air cleaner

1. Screw off the wing nut, remove the air cleaner cover and take out the element

X/E type

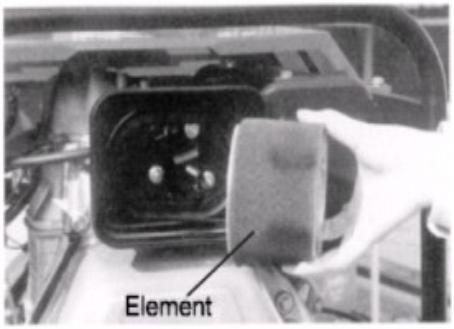


CAUTION:

- Do not wash the element with detergent.
- Replace the element when its output decrease or a bad exhaust color is noticed.
- Never run the generating set without the element, otherwise the rapid engine wear will result.

T type

2. Reattach the air cleaner cover and screw on the wing nut.



3.4 Check the generating set

1. Turn off the main switch and any other loads.

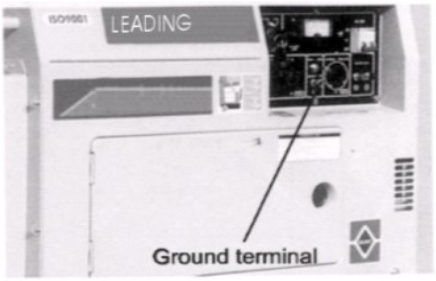
WARNING:

■ Be sure to turn off the main switch before starting.
The generating set should be earthed to prevent electric shocks.

WARNING:

■ The generating set should be earthed to prevent electric shocks.

■ Protection against electrical shock depends on circuit breakers specially matched to the generating set. If the circuit breakers require replacement they must be replaced with a circuit breaker having identical ratings and performance characteristics.



2. Handling of dual voltage type generating sets
Be sure to place the changeover switch in the correct position for the rated voltage of the working instrument.

CAUTION

- The main switch should always be kept in the “ON” position during operation.
- Before starting the engine, be sure to turn the switches of the working instrument (lighting apparatus, motor, etc.) to their “OFF” position. If the switches are not “OFF”, the sudden application of load when the engine is started could be very dangerous.

3.5 How to open the cabinet door and covers of - - LDE series generating set

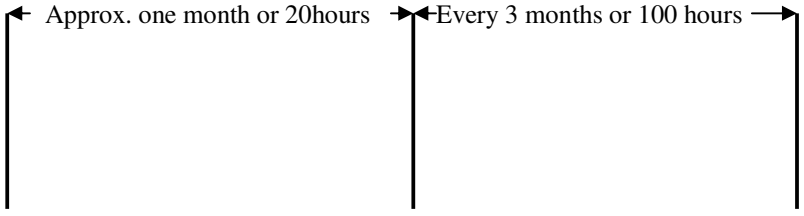
1. Open the cabinet door for daily inspection. Turn the lever counterclockwise and raise the door
2. Loosen the bolt of the air cleaner check port cover to check the air cleaner.
3. Screw off the wing nut to open the cover. then check the nozzle cover.

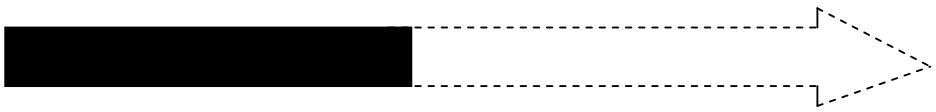
3.6 Break-in period operation

The first 20hrs are the break-in period of the engine, the operator must obey to following items:

- Warm up the engine 5 minutes after the initial starting. Run the engine at low speed and zero load before the engine becomes warm.

- Avoid applying any heavy loads during the break-in period.- - recommends to run the engine at 3000r/min with 50% load in break-in period.
  Replace the engine oil on time.
- Replace the engine oil while the engine is warm after 20-hours-running, the old engine oil will be drained out completely.





4. START THE GENERATING SET

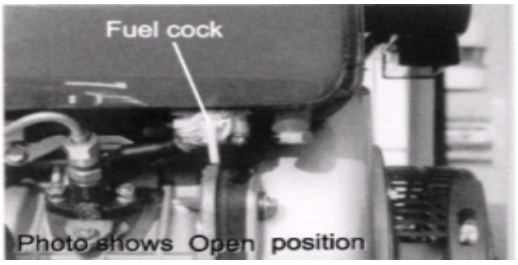
WARNING

■ Do not hook up tools or other apparatus to the generating set before starting.

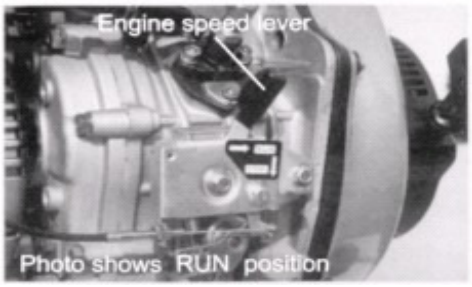
4-1 Recoil starting

Start the engine according to the following procedures:

1. Open the fule cock.



2. Set the engine speed lever at the RUN position.



3. Pull out the recoil starter handle.

■ Pull out the handle until you feel the resistance, then return it back to the initial position.
■ Press down the decompression lever. It will return automaticallly when the recoil starter is pulled.
■ Pull out the recoil starter handle briskly with both hands.

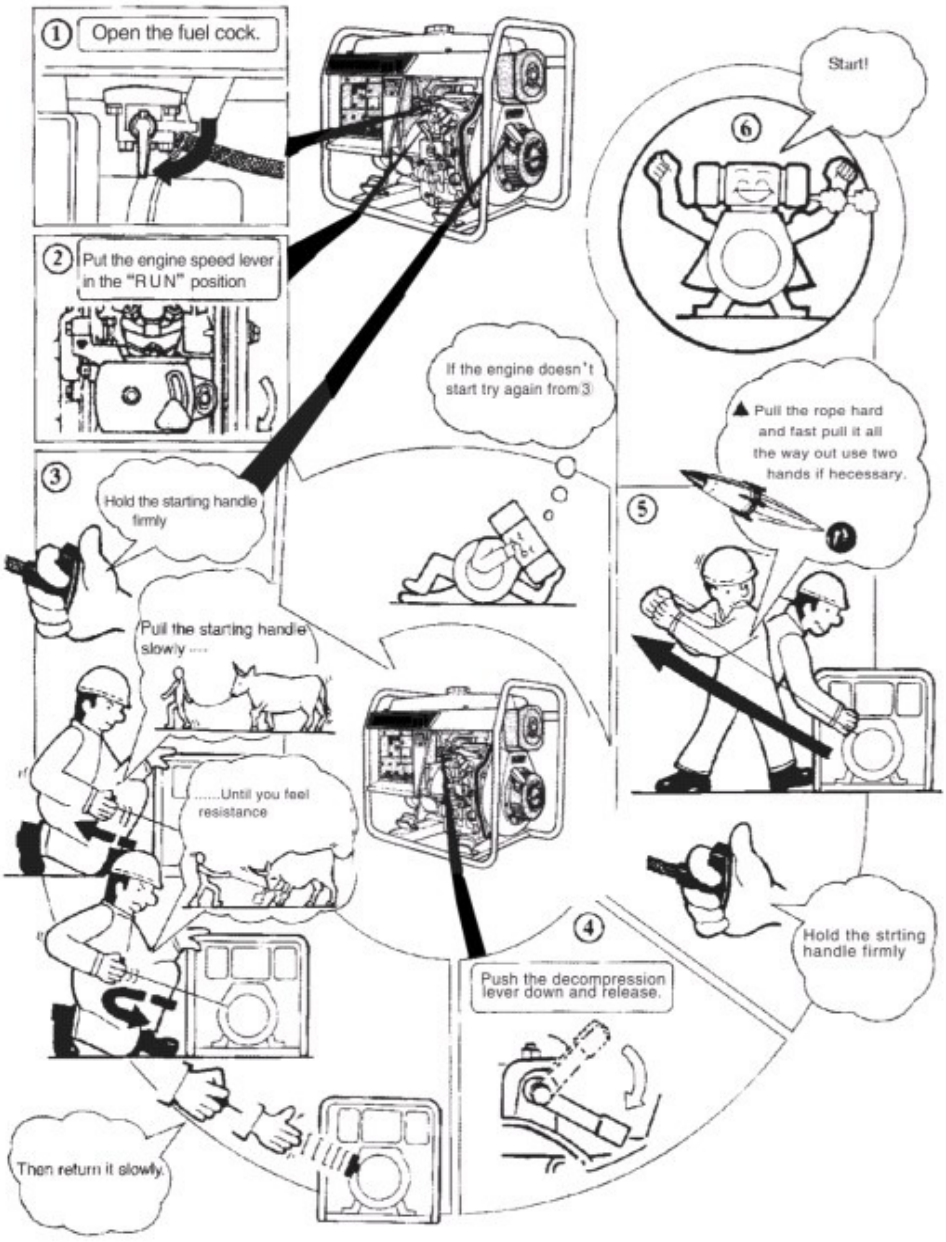
CAUTION

- Do not hook up tools or other apparatus to the generating set before starting.
- Do not allow the handle grip to snap back against the engine. Return it gently to
  prevent damage to the starter.
- When the engine is difficult to start in cold weather, remove the screw plug from the cylinder head cover and add 2cc engine oil.

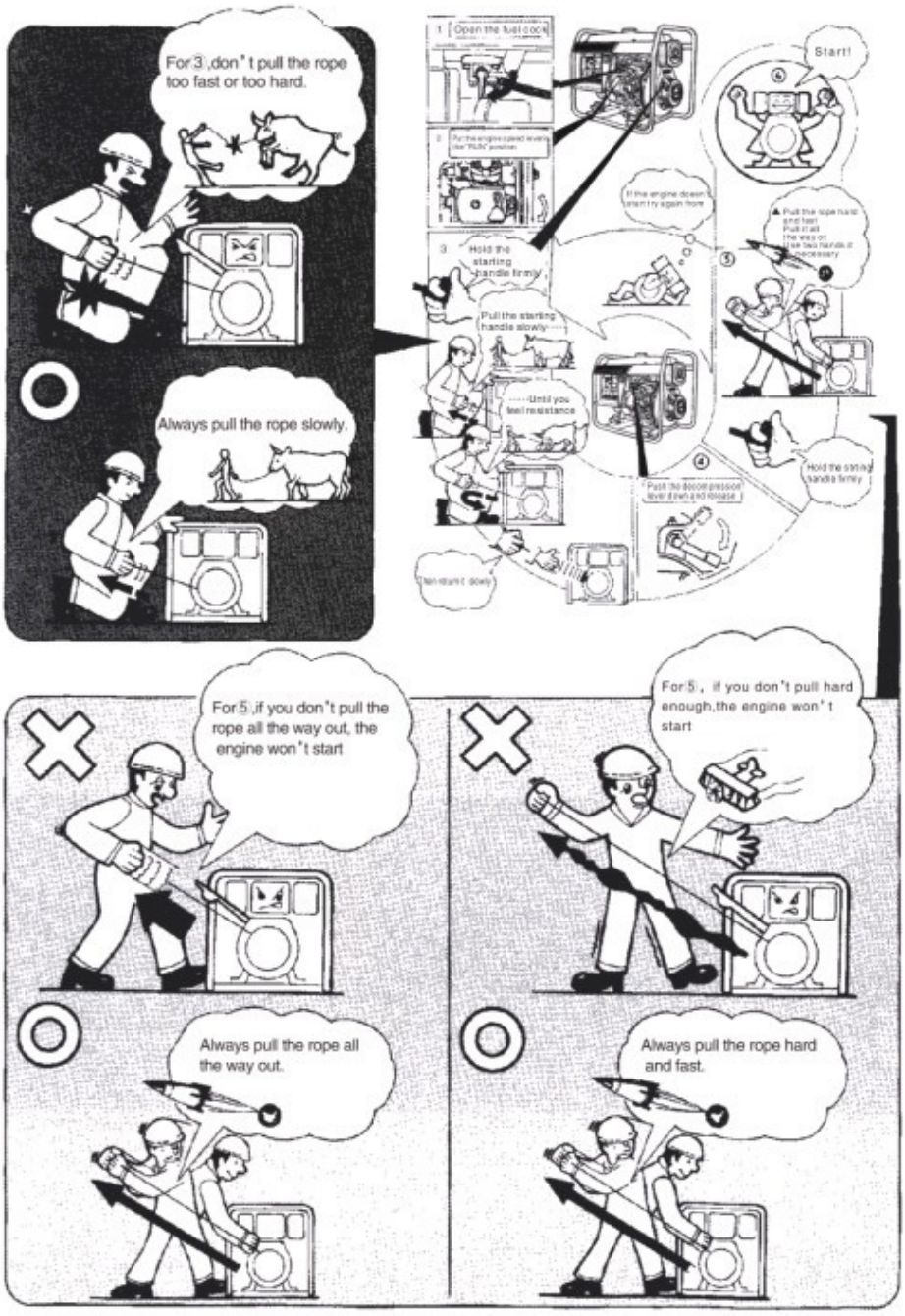
CAUTION

- Always screw on the screw plug on the cylinder head cover except filling. to prevent the rain and dirty flowing into the engine body. Otherwise the quick wear of the internal parts and other serious problems will result.

Recoil starting


1
Open the fuel cock.
2
Put the engine speed lever in the "RUN" position
3
Hold the starting handle firmly
Pull the starting handle slowly ....
.....Until you feel resistance
Then return it slowly.
4
Push the decompression lever down and release.
Hold the strting handle firmly
5
▲ Pull the rope hard and fast pull it all the way out use two hands if necessary.
If the engine doesn't start try again from③
6
Start!

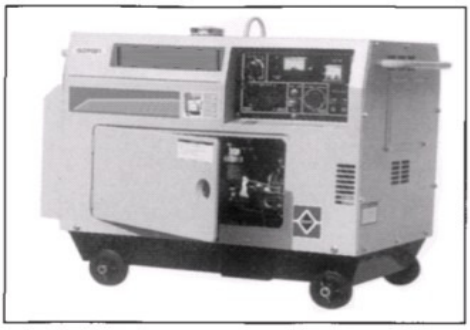
Recoil starting


For 3 ,don't pull the rope too fast or too hard.
Always pull the rope slowly.
1 Open the fuel cock
Start!
Hold the starting handle firmly
Pull the starting handle slowly
Until you feel resistance
Hold the starting handle firmly
For 5 ,if you don't pull the rope all the way out, the engine won't start
For 5 , if you don't pull hard enough,the engine won't start
Always pull the rope all the way out.
Always pull the rope hard and fast.

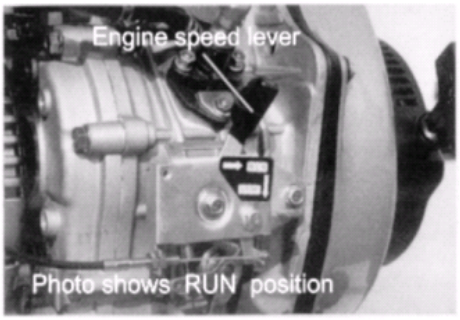
4.2 Electric starting

1. Starting (The preparations for electric starting are the same as for the recoil starting.)

■ Open the fule cock.



■ Set the engine speed lever at “RUN” position.



■ Turn the starting key clockwise to “START” position.
Remove your hand from the key as soon as the engine starts.
If the starting motor does not start after 10 seconds, wait 15 seconds before starting it again.

CAUTION

■ Run the starting motor for long time will cost the battery power greatly even burn out the motor

■ Always leave the starting key at “ON” position while the engine is running.

2. Battery
Check the battery electrolyte level every month. Refill the distilled water until the upper limits if the electroly dropped to the lower limits.

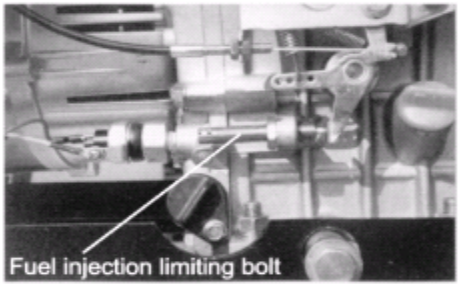
CAUTION

- If the electrolyte level is too low, the engine may fail to start because there is not sufficient power. On the other side, if the electrolyte level is too high, the fluid will corrode the surrounding parts. Do keep the electrolyte level between the upper and lower limits.

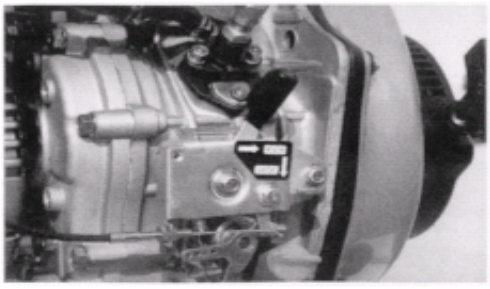
5. OPERATE THE GENERATING SET

5.1 Operate the generating set

1. Warm up the engine without load three minutes.



2. Concerning the generating set with Low Oil Warning System, check that the Oil Alarm Lamp is not lit.



CAUTION

- For the generating set Low Oil Warning System, the Oil Alarm Lamp will activated by low oil pressure or engine oil shortage, simultaneously, the engine will stop. The engine will stop immediately if restarted without refilling the engine oil. Check the oil level and refil.
- Do not loosen or readjust either the engine speed limiting bolt or fuel injection limiting bolt, otherwise, otherwise, the performance will be affected.

5.2 Checks during the running

1. Whether there is abnormal sound or vibration;

2. Whether the engine misfires or runs rough;
3. Check the color of the exhaust.(Is it black or too white?)
   If you notice any of the above-mentioned phenomenon happened, stop the engine and find out the fault cause or contact with - - agent.

CAUTION

- If the engine has been running, the muffler will be very hot. Be careful not to touch the muffler.
- Never refill the fule tank while the engine is running.

6.LOAD

- Do not startn 2 or more machines simultaneously. Start them one by one.
- Do not use floodlights together with other machines.

- The generating set must not be connected to other power sources, such as the power company supply mains. In special cases where stand-by connection to existing electrical systems is intended, it shall only be performed by a qualified electrician who has to consider the differences between operating equipment using the public electrical supply network and operating the generating set.
- When using extension lines or mobile distribution networks the total length of lines for a cross section of 1.5 mm^2 should not exceed 60m; for a cross section of 2.5mm^2 this should not exceed 100m.

6.1 AC application

1. Be sure to run the generating set at rated speed, otherwise AVR(Automatic Voltage Regulator) will produce the forced excitation. If the running is for a long time under such condition, AVR will be burned out.
2. After switching on the switch, observe the voltmeter on the panel of the control cabinet, the voltmeter should point to 230V±5%（50HZ）for single-phase generating set; 400V±5%（50HZ）for three-phase generating set,then the loading can be carried out.
3. When the double voltage generating set changes over the voltage,

the

air switch should be set at“OFF” postion. Otherwise the generating set and electric devices will be burned out and damaged.

4. Connect the equipment to the generating set in order. For the matter of the motor load, firstly the heavy-duty motor should be connected, then the light-duty motors. If the operation is false , the generating set will lag or stop suddenly. It is necessary to unload the generating set immediately and turn off the main switch and do checks.
5. Three-phase generating set

- Balance three phases during the operation. Stop the engine for check if the tolerance exceed 20%. Be sure to keep the tolerance among three phases less than 20%.
- The load for each phase must below the rated load as well as the current must less than rated current.
  A,B,C,D(or U,V,W,N) phase arrangement should be from left to right, or clockwise.
- Concerning starting the three phase asynchronous motors, first start the heavyduty motors, then start the light-duty motors.

- If coverloading of the circuit trips the AC circuit protector, reduce the electrical load on the circuit, and wait a few minutes before resuming operation.

6.2 DC applicetion

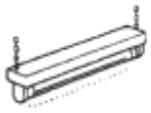
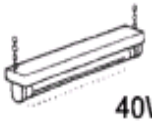
1. DC terminals are only for charging 12V battery.
2. Set the air switch at “OFF” position while charging. On the 12V output terminals, a charge switch can be connected so the switch can be used for on-and-off purpose.
3. Concerning the automatic type battery with the leads, be sure to disconnect the negative leads of the battery while charging.

- Connect the positive and negative poles of the battery with the positive and negative poles of DC terminals separately. Do not confuse them, otherwise the battery and generating set will burn out.
- Do not connect the positive pole of the battery with its negative pole, otherwise the battery damage will result.
- Do not connect the positive pole of the DC terminal with its negative pole, otherwise the generating set damage will result.
- When a large capacity battery is charged, excessive current flows, the fuse for the direct current will burn out.
- Do not run the generating set while it is still connected with the battery.
- Do not use DC 12V and AC at the same time.

CAUTION

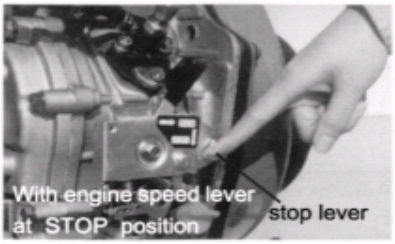
- Battery exhausts explosive gas. Keep sparks, flames, and cigarettes away from the battery. To prevent from creating a spark near the battery, always connect the charging cables to the battery first and only then to the generating set. When disconnecting, you should disconnect the cables at the generating set first.
- Charge the battery at a well-ventilated place.
- Before charging, remove the cap from each cell of the battery.
- Stop charging if the electrolyte temperature exceed 45℃.

6.3 Electrical appliance particularly motor-driven equipment will produce very high current while starting, the below table provides the reference for connecting these apparatus to the generator set.

TYPE	WATTAGE		TYPICAL APPLIANCE	EXAMPLE		
	STARTING	RATED		APPLIANCE	STARTING	RATED
· Incandescent lamp · Heating appliance	X1	X1	 Incandescent lamp TV 	 Incandescent lamp 100W	100VA (W)	100VA (W)
· Fluorescent lamp	X2	X1.5	 Fluorescent lamp	 40W Fluorescent lamp	80VA (W)	60VA (W)
· Motor-driven equipment	X3~5	X2	 Refrigerator Electric fan	 Refrigerator 150W	450-750VA (W)	300VA

7. STOP YOUR GENERATING SET

1. Disconnect the load from the generating set.
2. Turn off the air switch of the generating set,
3. Set the speed lever at “RUN” position, run the generating set without load for about 3 minutes. Do not stop the engine suddenly, otherwise the temperature will increase abnormally, the nozzle will blocked and the generating set will be damaged.



- Press down the stop lever.
- Concerning the electric starter, turn the key to “OFF”.
- Turn the fuel cock lever to “S” position.
- Pull out the recoil starter handle until you feel resistance (at this position, both intake/exhaust valve are closed.) and leave the handle in this position. This prevents the engine from rust.

WARNING

- If the engine keep on running even after the speed lever is placed at the “STOP” position, either turn the fule cock to the “CLOSE” position or loosen the nut of high pressure fule pipe on the pump side to stop the engine.
- Do not stop the engine with the decompression lever.
- Do not stop the generating set with load. Stop it after the load removed

8. PERIODIC CHECK AND SERVICE

Periodic check and service are very important for keeping the engine in good condi-

tion and durable. The chart below indicates what checks to make and when to make them.

WARNING

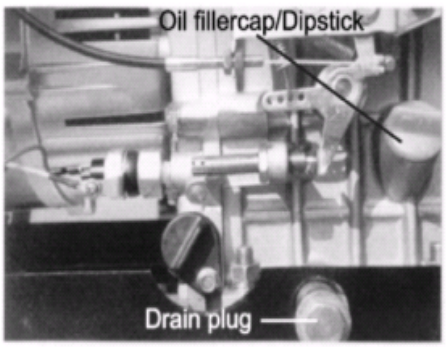
- Shut off the engine before performing any service. If the engine must be run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.
- After the generating set has been used, clean it immediately with a cloth to prevent corrosion and to remove sediment.

Interals / Item	Every day	First month or 20 Hrs	Third month or 100 Hrs	sixth month or 500 Hrs	Every year or 1000 Hrs
Check and refill fuel oil	○				
Drain out fuel oil		○			
Check and refill engine oil	○				
Check for oil leakage	○				
Check and tighten fastening parts	○			● Tighten the cylinder head bolts	
Replace engine oil		○ (First time)	○ (Second time)		
Clean engine oil filter				○ (Replace if necessary)	
Replace air cleaner element	(Service more frequently when used in dusty areas)			○ (Replace)	
Clean fuel oil filter				○	● (Replace)
Check fuel injection pump				●	
Check nozzle				●	
Check fuel pipe				● (Replace if necessary)	
Adjust clearance of intake/exhaust valves		● Fisrt time)		●	
Grind intake/exhaust valves					●
Replace piston ring					●
Check battery electrolyte	Every month				
Check carbon brush and slip ring				●	
Check insulation resistance	The generating set has been stored more than 10days ○				

Note:"○" indicates that special tools are required, please contact with — — agent.

8.1 Replace engine oil

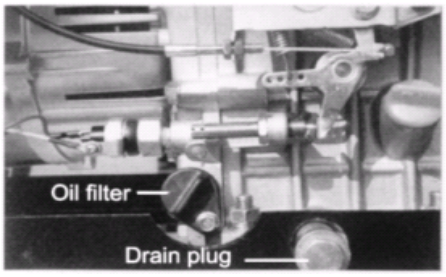
Remove the oil filler cap. Remove the drain plug and drain the old oil while the engine is still warm. The pulg is located on the bottom



of the cylinder block. Tighten the drain plug and refill with the recommended oil.

8.2 Clean the engine oil filter

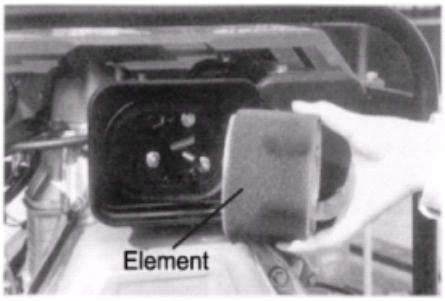
Cleaning Time	every 6 months or 500 hours
Replace if necssary	



8.3 Replace the air cleaner element

Do not clean the air cleaner element with detergent.

Replace time	Every 6 months or 500 hours



CAUTION

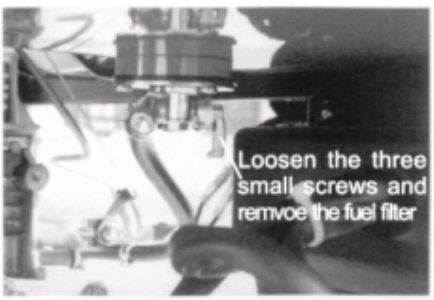
■ Never run the engine without the element or with a defective element.

8.4 Clean and replance fule oil filter

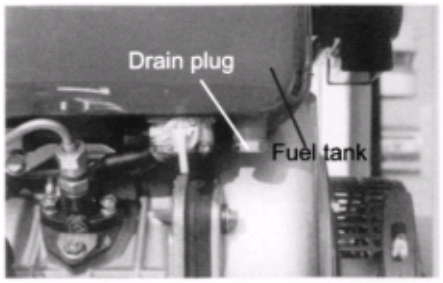
The fuel oil filter also has to be cleaned regularly to insure maximum engine output.

Clean time	Every 6 months or 500 hrs
Replace time	Every year or 1000 hrs

1. Drain out the fule from the fule tank.



2. Drain out the fule from the fule tank.
   Screw off the small screw of the fule cock and pull out the filter from the filler port.
3. Wash the filter thoroughly with diesel fule.
   Loosen the fastening mut, bottom cover and delivery discs for cleaning the deposit carbon.



8.5 Tighten cylinder head bolt

Tightening the cylinder head bolt requires a special tool. Do not try yourself. Contanct with - - agent.

8.6 Check the injection nozzle and fule injection pump

1. Adjust the clearance of the intake/exhaust valves.
2. Grind the intake/exhaust valves.
3. Replance the piston ring.

All these operation require special tools and skills, contact with your - - agent.

WARNING

■ Do not perform the injection nozzle test near an open fire or any other kind of fire. The fule spray may ignite. Do not expose bare skin to the fule spray. The fule may penetrate the skin and cause injury to the body. Always keep your body away from the nozzle.

8.7 Check and refill the battery electrolyte and charge the battery

The diesel uses a 12V battery. Battery electrolyte will be lost through continuous charging and discharging.

Before starting, check for physical damage to the battery and also the electrolyte levels, and refill the distilled water till to the upper level if necessary. When actual damage is discovered, replace the battery.
Check the battery electrolyte monthly.

WARNING

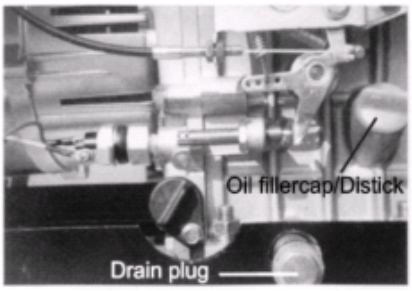
- The battery electrolyte contains sulfuric acid. Protect your eyes, skil and clothing. In case of contact, flush thoroughly with water and get prompt medical attention, especially if your eyes are affected.
- The battery exhaust hydrogen gas, which can be highly explosive. Do not smoke or allow flames or sparks near the battery, especially during charging.

8.8 Check the generating set carbon brush slip ring

Often check the generating set carbon brush slip ring. Readjust if there is spark.

9. LONG-TERM STORAGE

If store the generating set for long periods, make the following preparation.



1. Operate the engine for about 3 minutes and then stop.
2. Stop the engine. Drain the engine oil while the engine is still warm and fill fresh oil.

3. Remove the screw plug on the cylinder head cover and refill 2cc engine oil, then put the plug in place.

4 ■ Recoil starting:
Push the decompression lever down(Non-compression position) and hold it while you pull the recoil starter2～3times.(Do not start the engine.)

■ Electric starting:
Turn the engine 2～3 seconds with the decompression lever set at the non-compression position, and the starting key at the "START" position.(Do not start the engine.)

5 Pull the decompression lever up. Pull the recoil starter slowly. Stop when you feel resistance.(at this position, both intake/exhaust values are closed to prevent the engine from the rust.)

6 Wipe off the oil and dirt from the engine and store in a dry place.

WARNING

■ Indication that the installation and major repair work shall be carried out only by specifically trained personnel.

10. TROUBLESHOOTING AND REMEDY

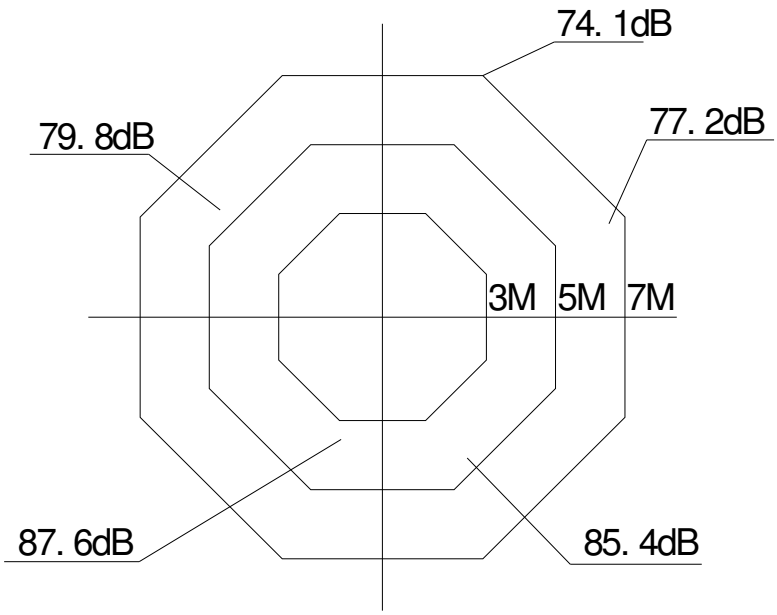
	Fault Cause	Remedy
The diesel engine can not start	Fuel oil is not sufficient	Refill the fuel oil
	Fuel cock is not at START position	Turn it START position
	Fuel injection pump and nozzle do not delivery the fuel or delivery insufficient fuel.	Remove the nozzle and repair it at test table
	The governor lever is not at START position.	Set the lever to START position
	Check the engine oil level.	The specified oil level should be between the upper level and lower lever
	The nozzle has dirty.	Clean the nozzle
	The speed and force to pull the recoil starter are not enough.	Start the enging according to the start procedures included in this book.
The generating set can not generate	The battery has no electricity.	Charge it or replace it with a new one.
	Main switch not be turned on.	Turn the main switch to ON position.
	The carbon brush already worn.	Replace the carbon brush.
	The contact of the socket is not good.	Adjust the socket.
	The rated speed can not attached.	Adjust it according to the requirements.
	AVR is damaged	Replace the AVR.

CAUTION

■ The installation and major repair work shall be carried out only by specifically trained personnel.

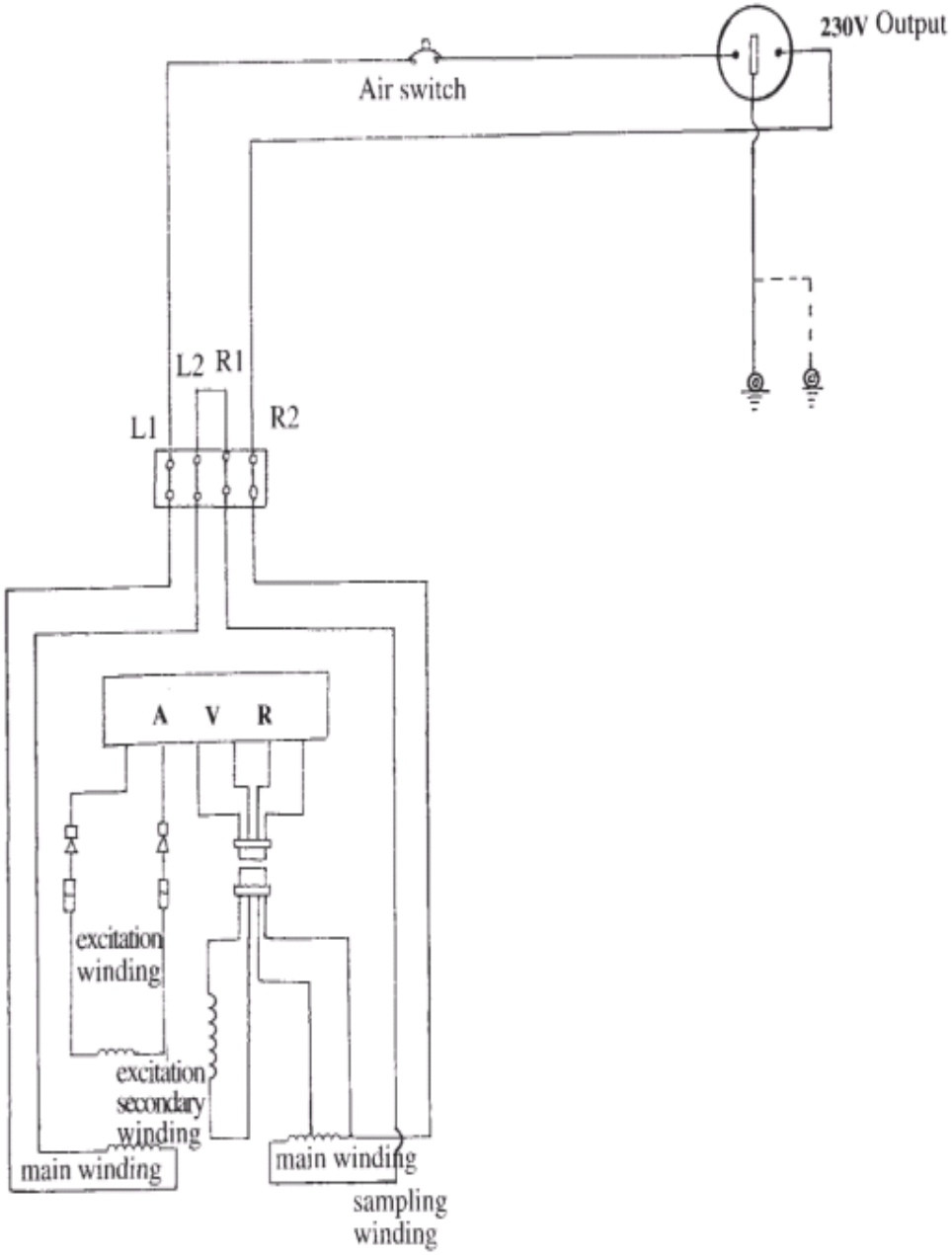
11. Noise

The figures quoted are emission levels and are not necessarily safe working levels. Whilst there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of work-force include the characteristics of the work room, the other sources of noise, etc. i.e. the number of machines and other adjacent processes, and the length of time for which an operator is exposed to the noise. Also the permissible exposure level can vary from country. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk

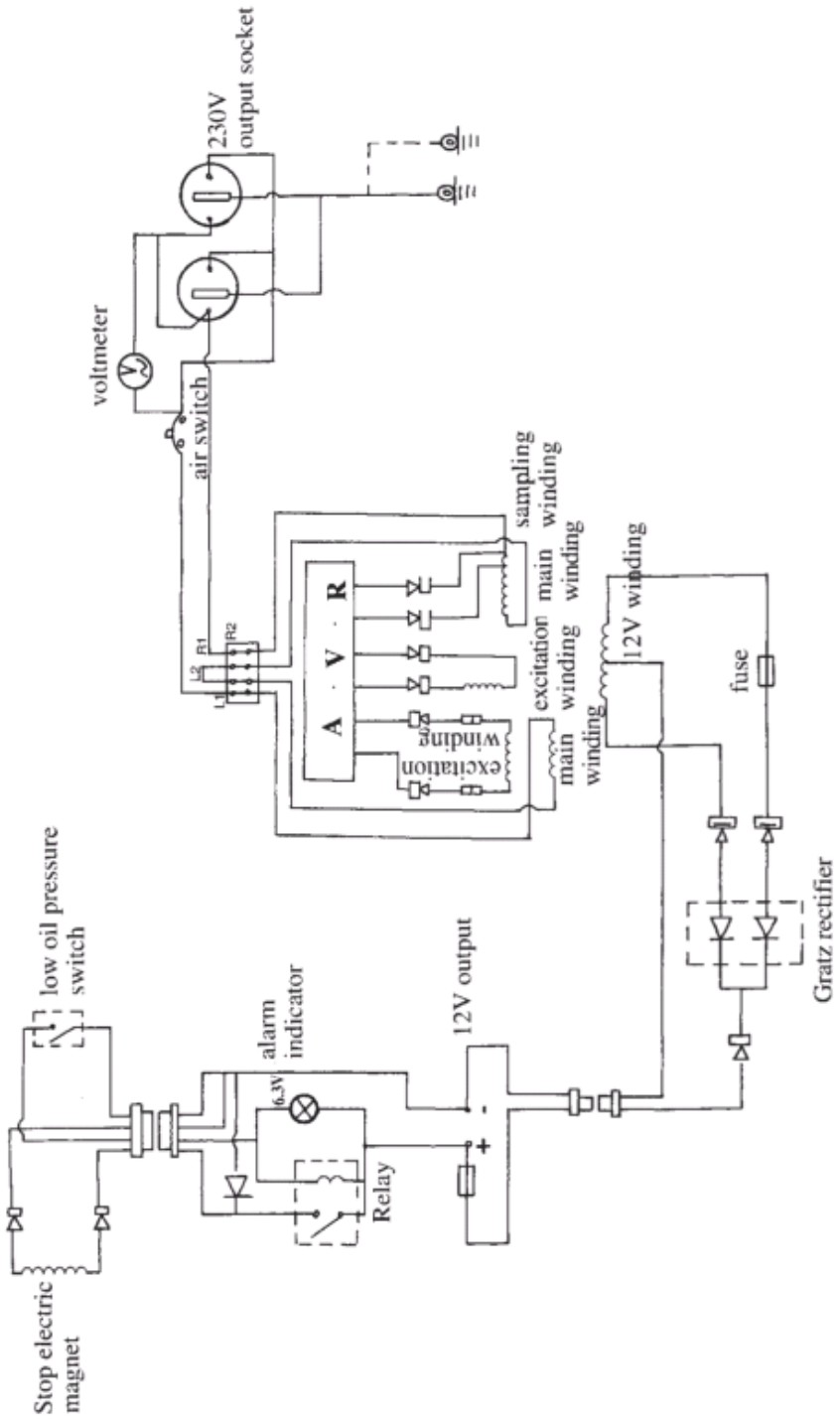


Electric Wiring Diagram for All Types of the Set

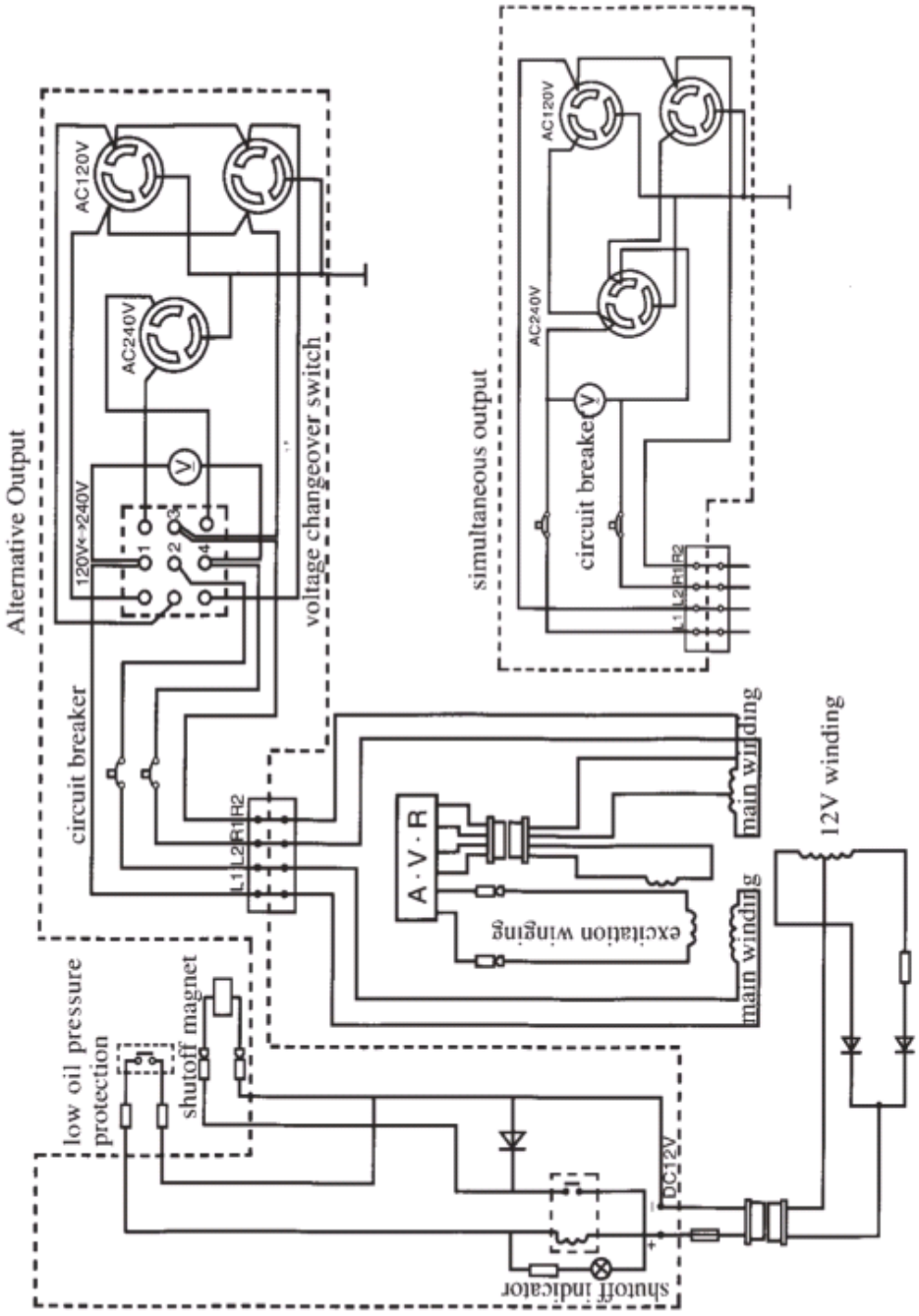
<1> C type electric wiring diagram



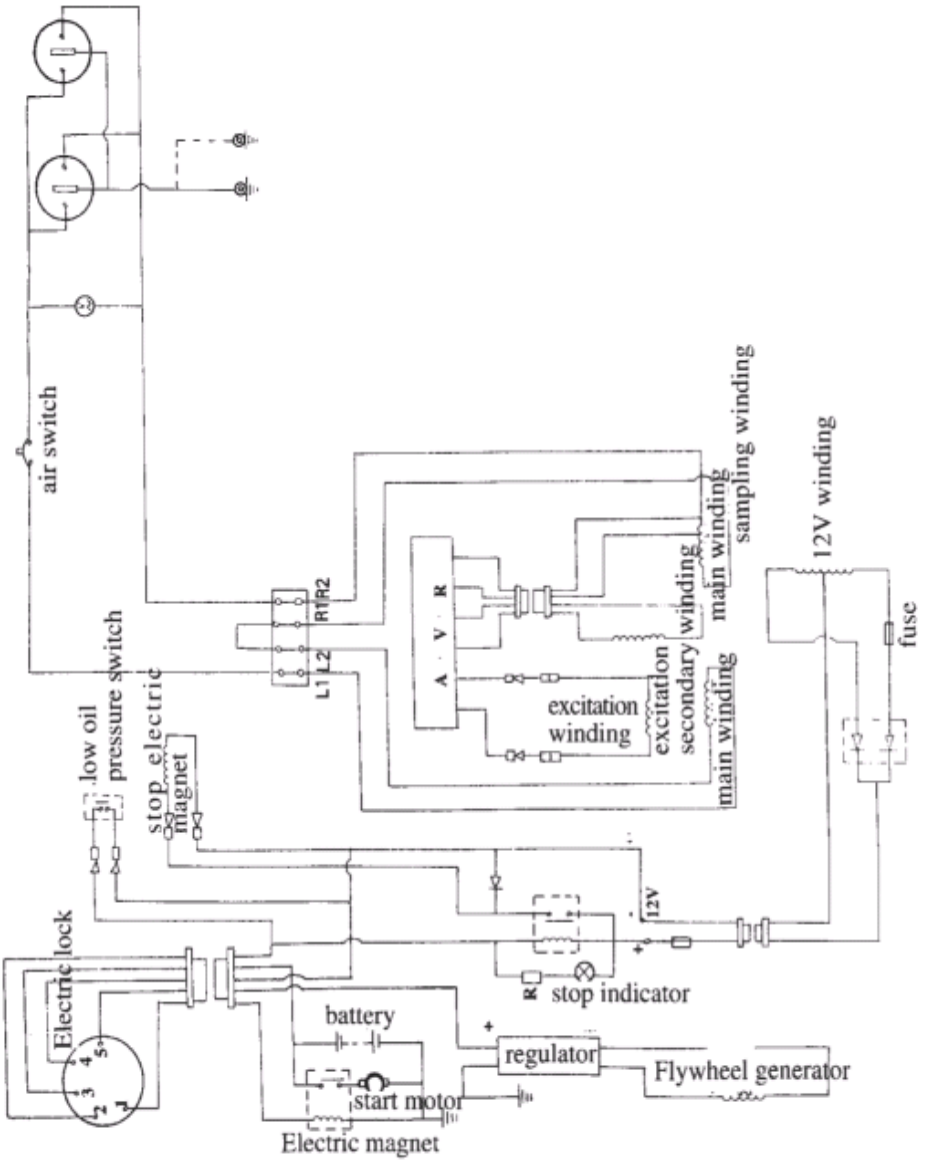
<2> X type electric wiring diagram (single voltage output)



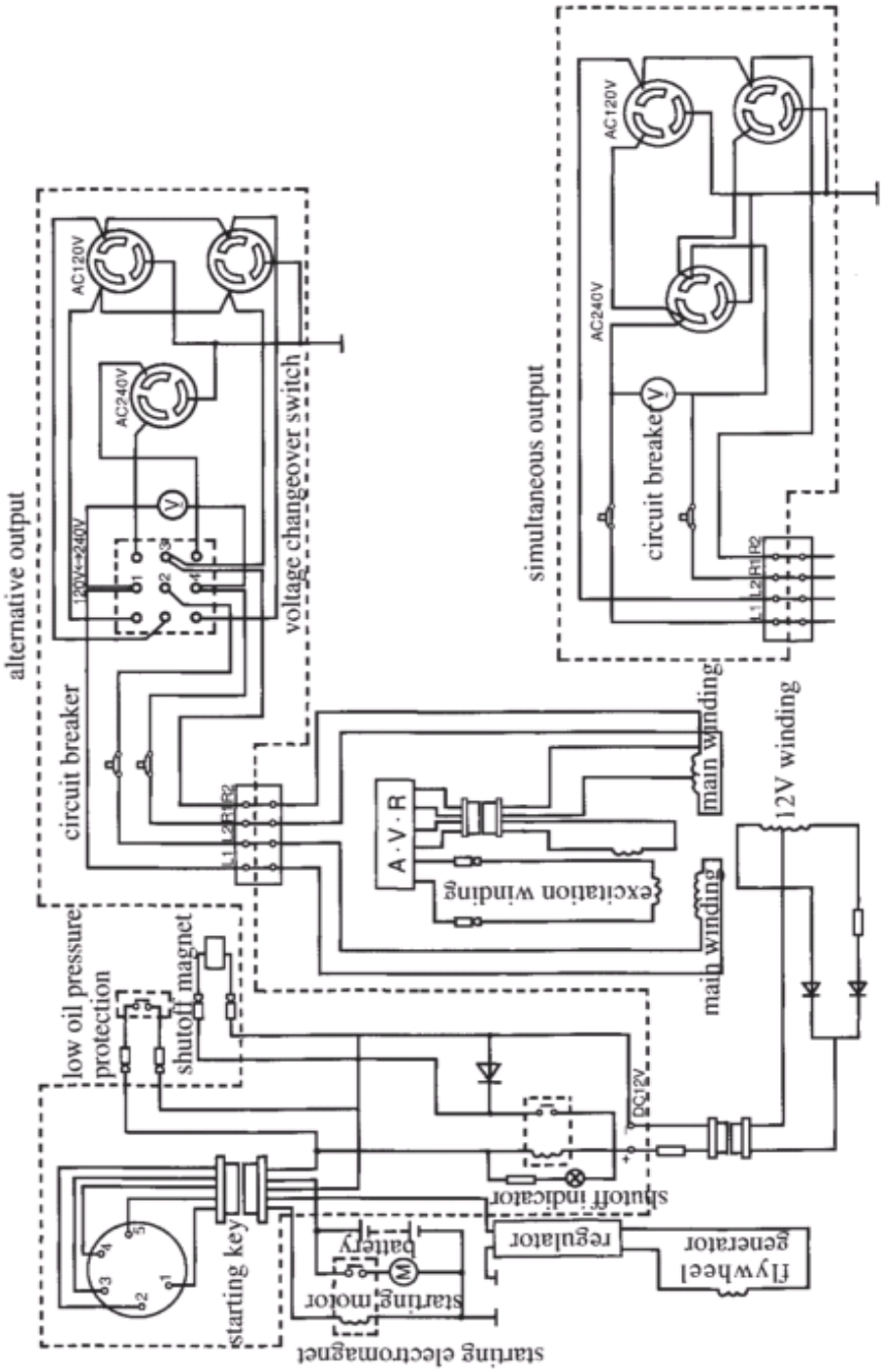
<3> X type electric wiring diagram (double voltage output)



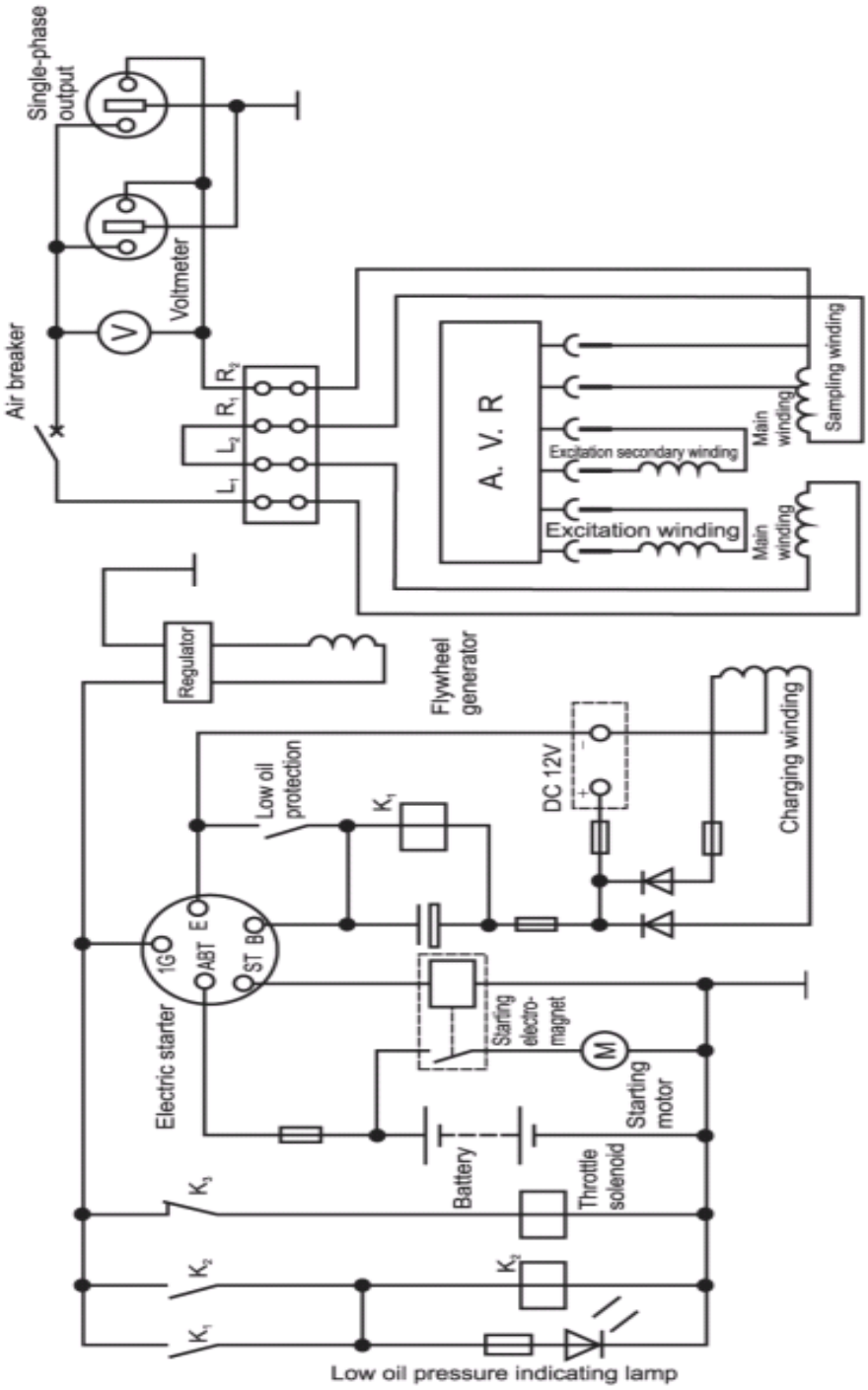
<4> E type electric wiring diagram (single voltage output)



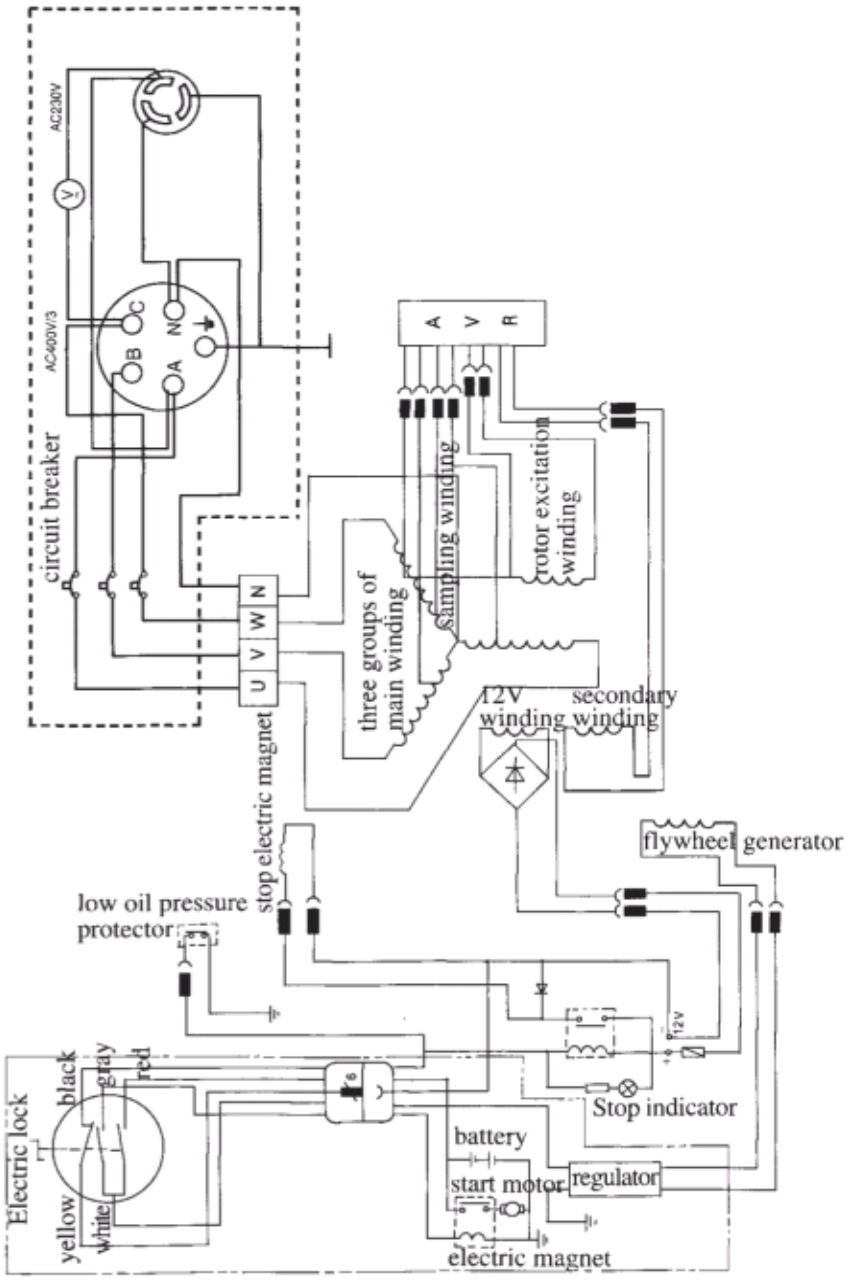
<5> E type electric wiring diagram (double voltage output)



<6> E type electric wiring diagram

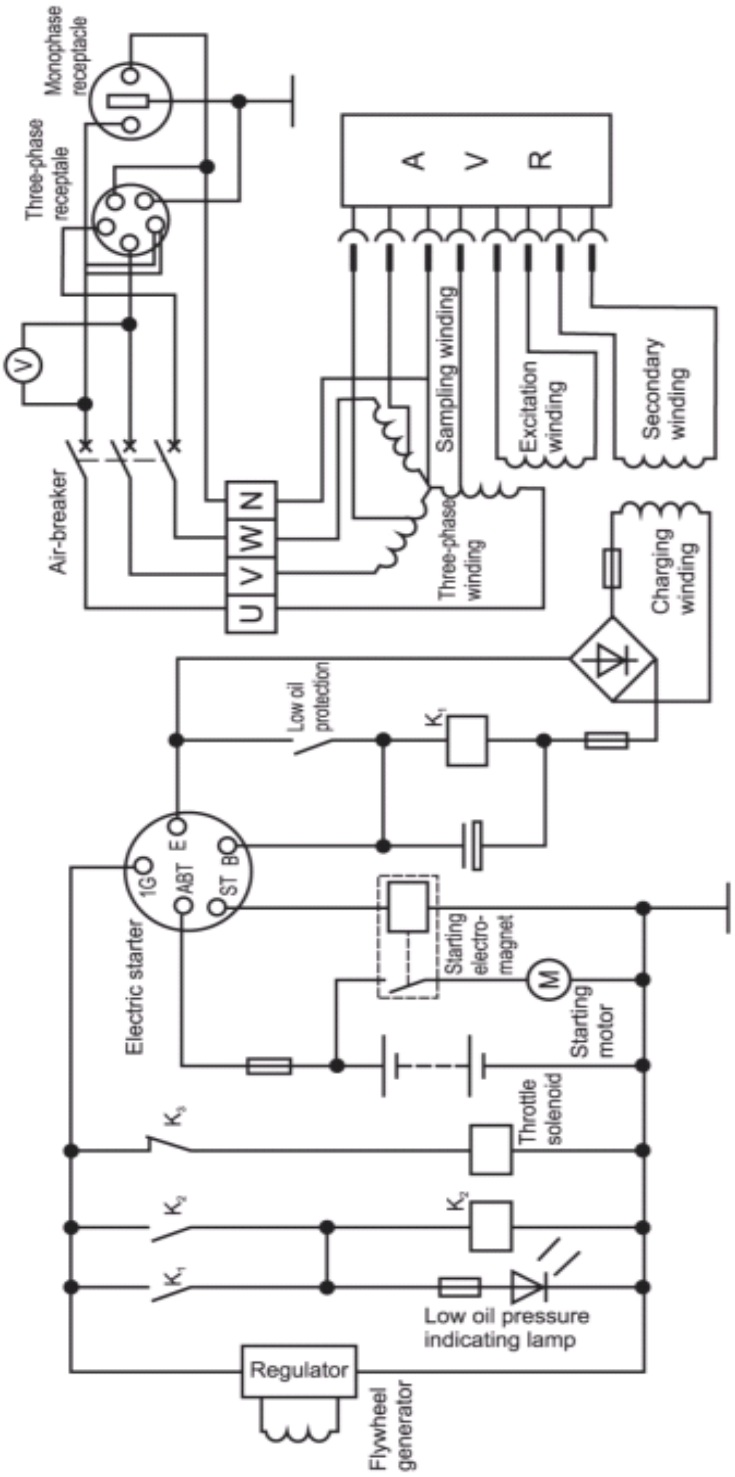


<7> X3, E3 type electric principle diagram



Description: For set X3 type, the components in the two –point-and-line box are not mounted.

<8> T3 type electric principle diagram



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